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Byrne

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(54) **ROTARY ARROWHEAD ASSEMBLY**

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(51) **Int. Cl.**
F42B 6/08 (2006.01)

(52) **U.S. Cl.** **473/578**

(58) **Field of Classification Search** 473/583, 473/584

See application file for complete search history.

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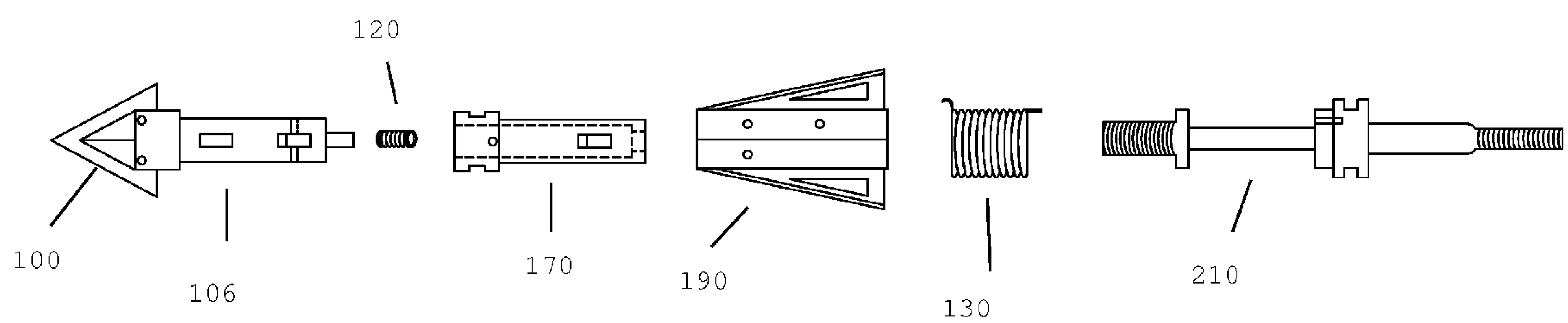
(57) **ABSTRACT**

An arrowhead assembly includes a blade tube that may rotate in flight at a rate during flight that is independent from the arrow shaft rotation. The assembly, upon and after impact with the target, continues rotational motion of the blade tube to penetrate a substantial distance into the target. Such characteristics are facilitated by the spiral-shaped, or twisting, nature of the blades as well as the rotational motion that is imparted by a spring arrangement of the assembly after compression and expansion of the spring arrangement upon impact.

11 Claims, 8 Drawing Sheets



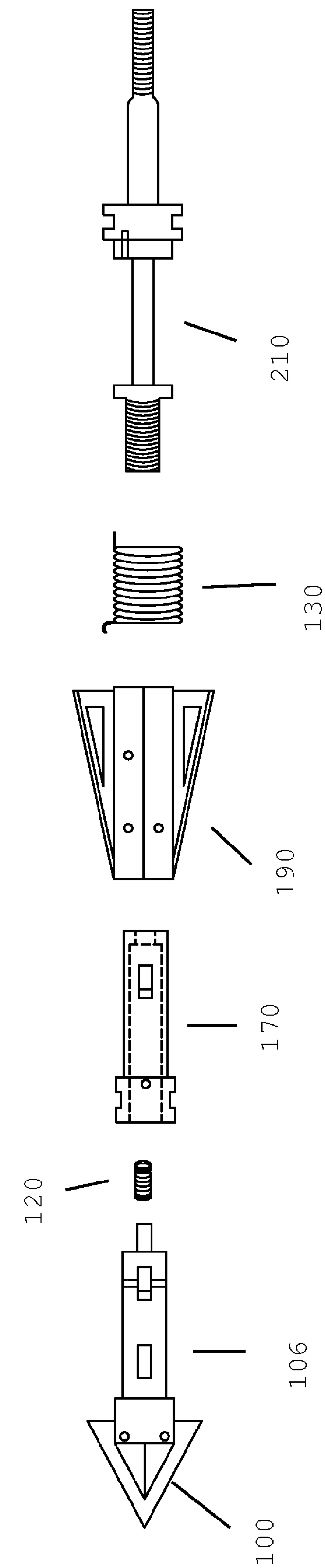


FIG. 1

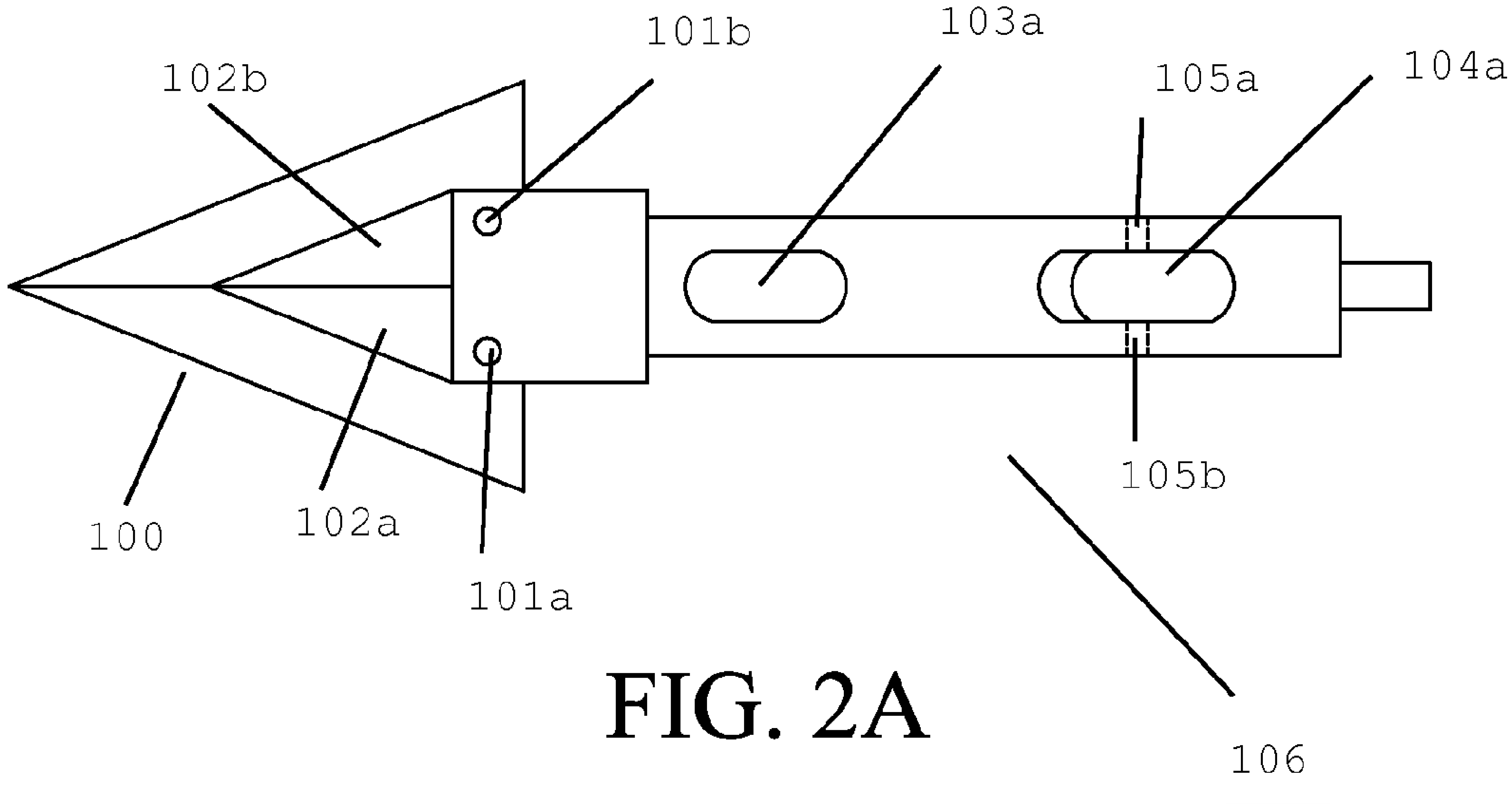

101b
103a
102b
105a
104a
100
102a
101a
105b
106

FIG. 2A

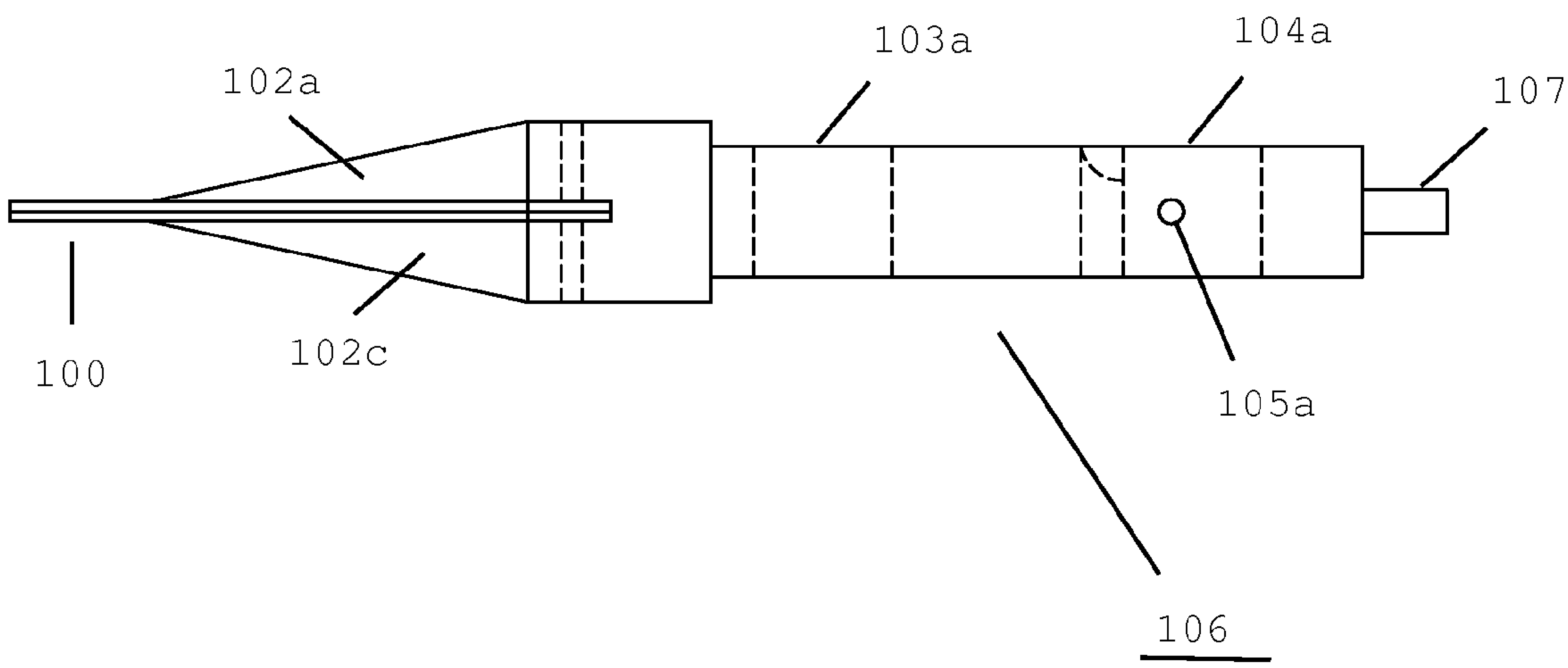

103a
104a
102a
107
100
102c
105a
106

FIG. 2B

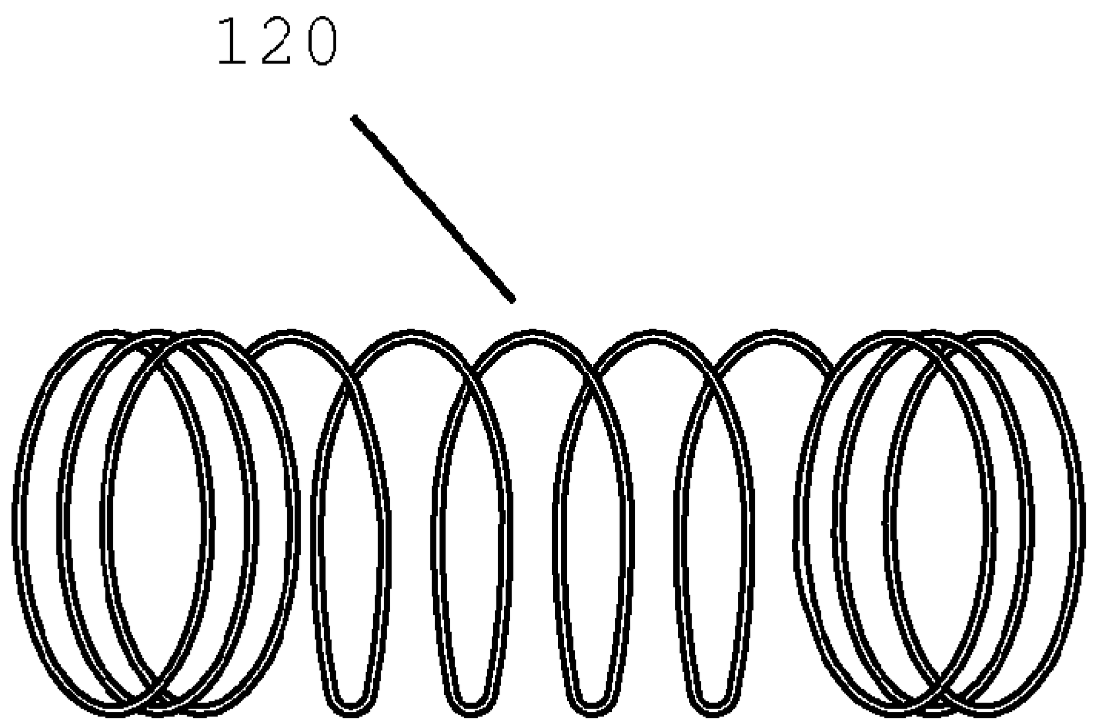


FIG. 3

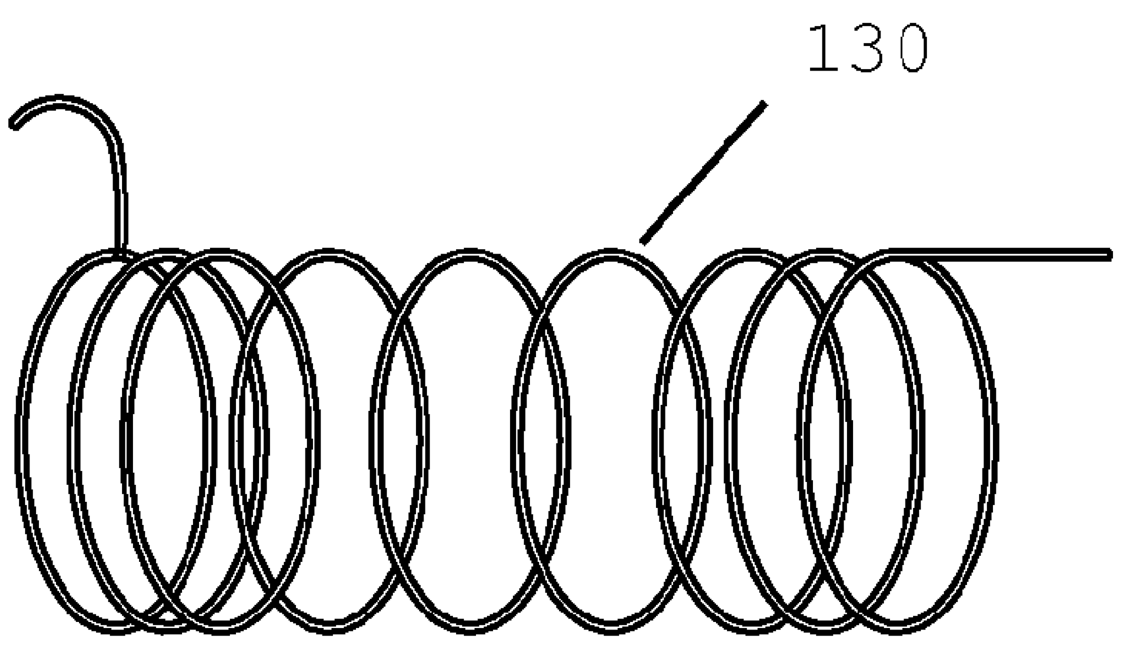


FIG. 4A

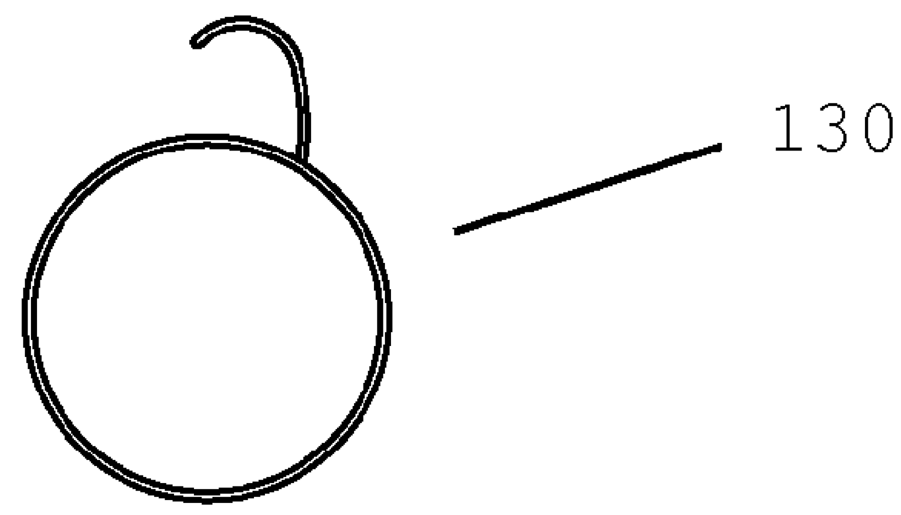


FIG. 4B

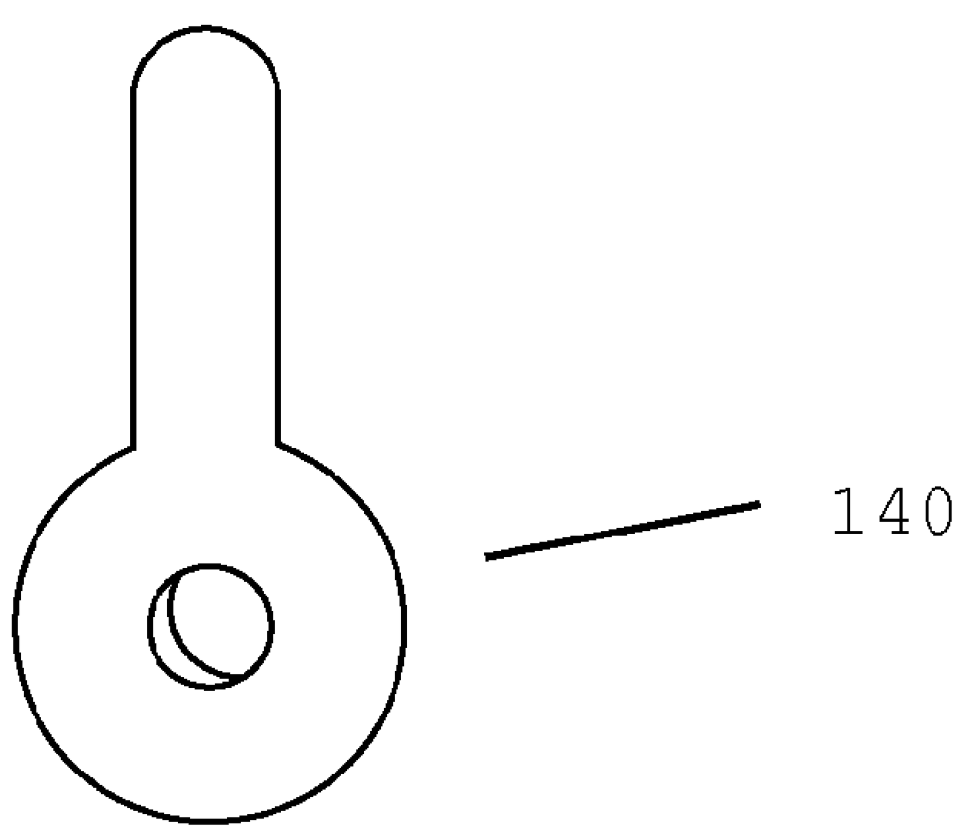


FIG. 5

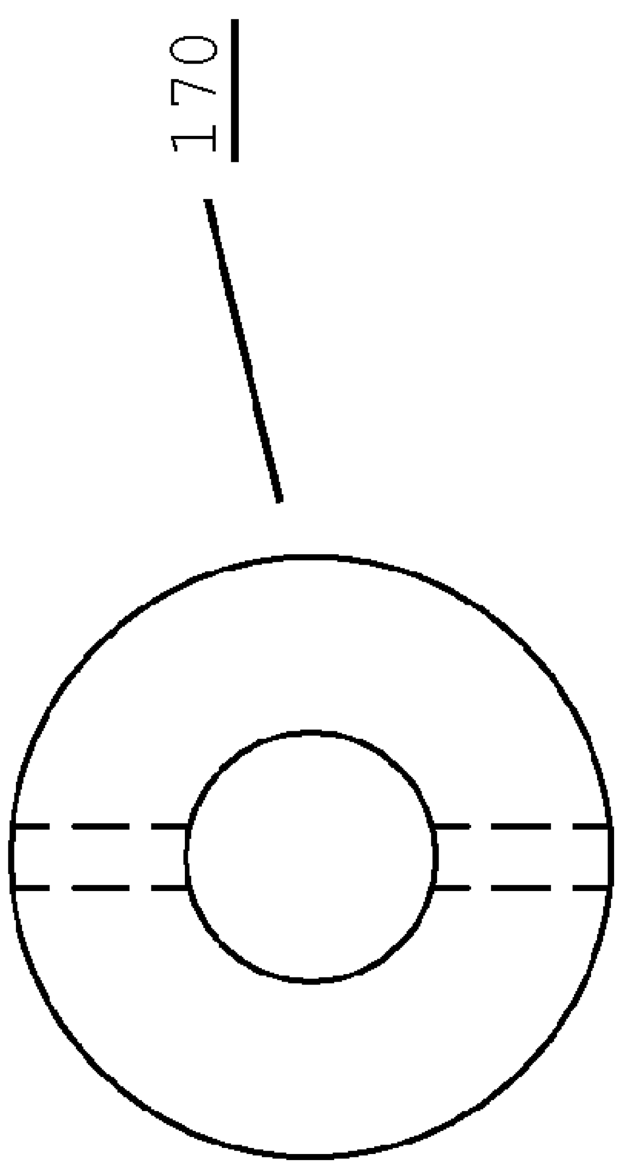


FIG. 6

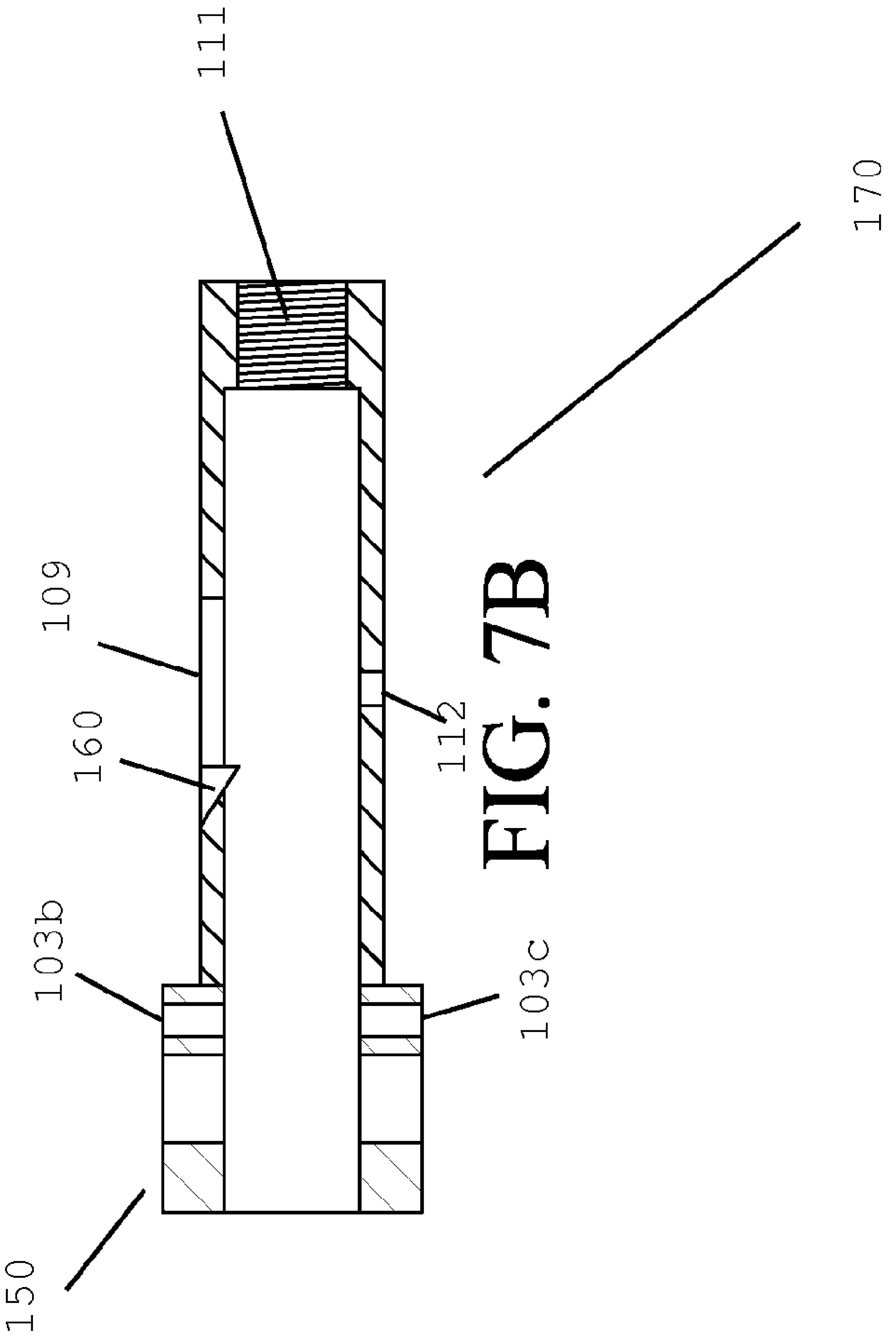


FIG. 7B

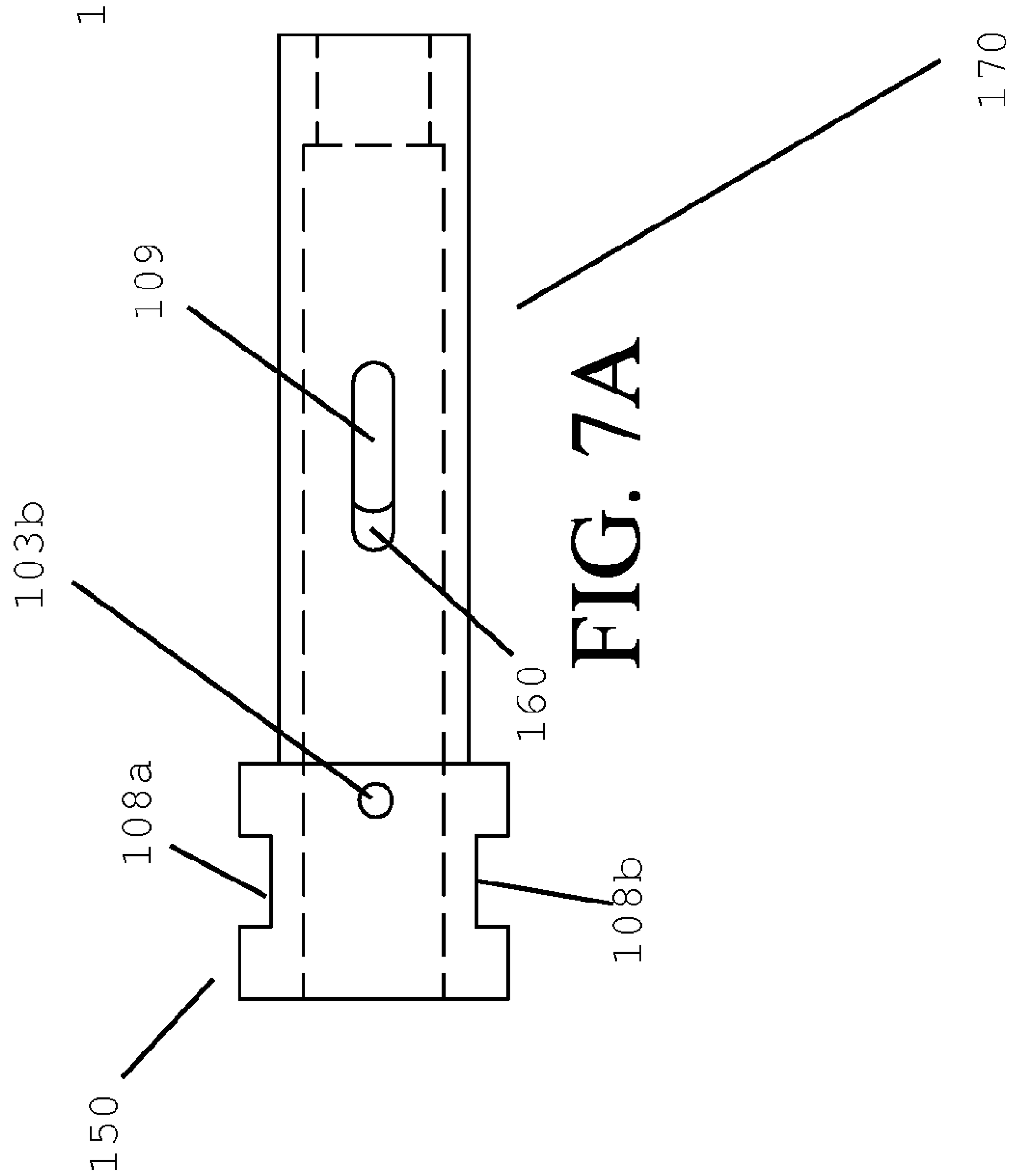


FIG. 7A

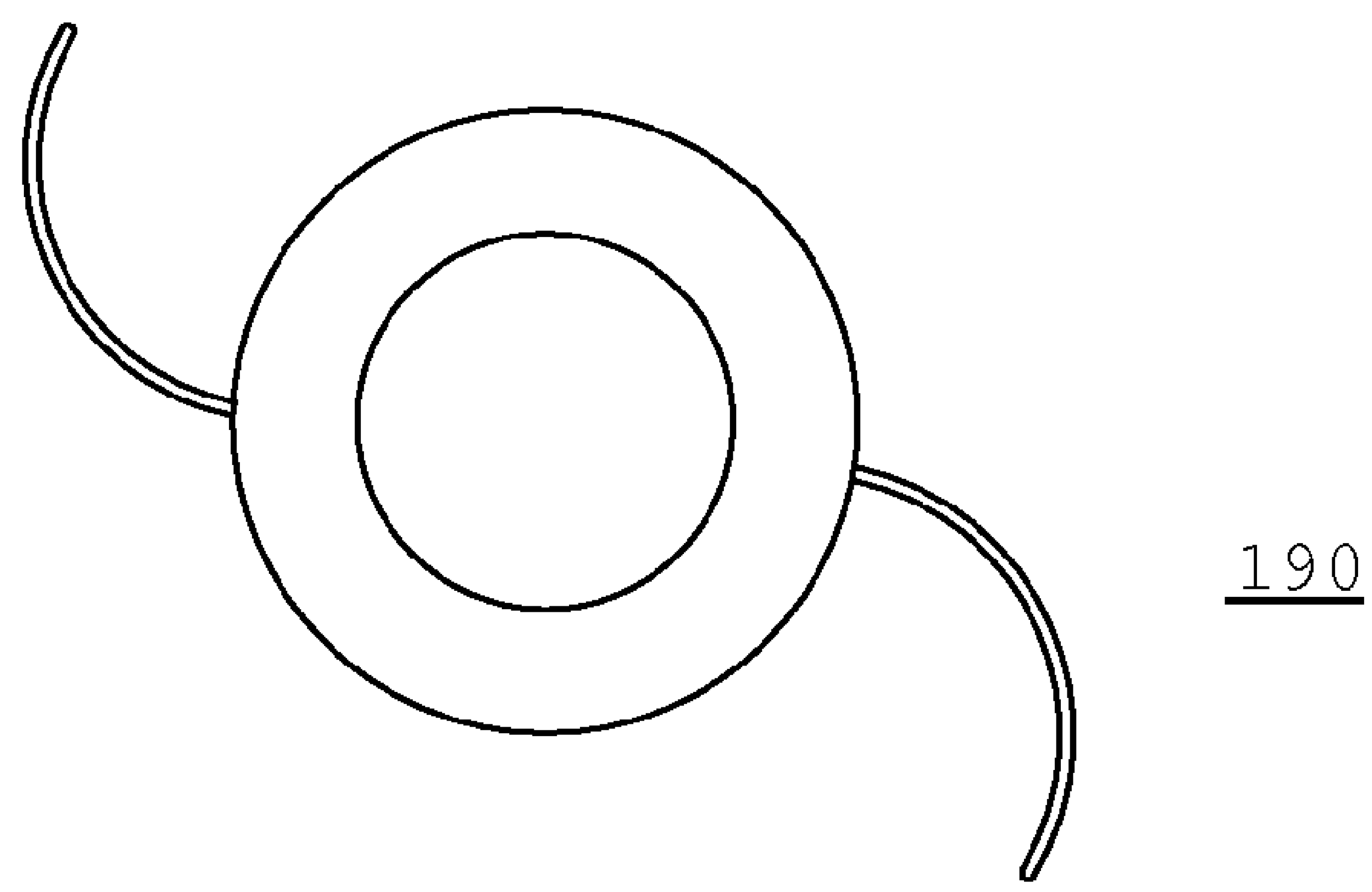


FIG. 8A

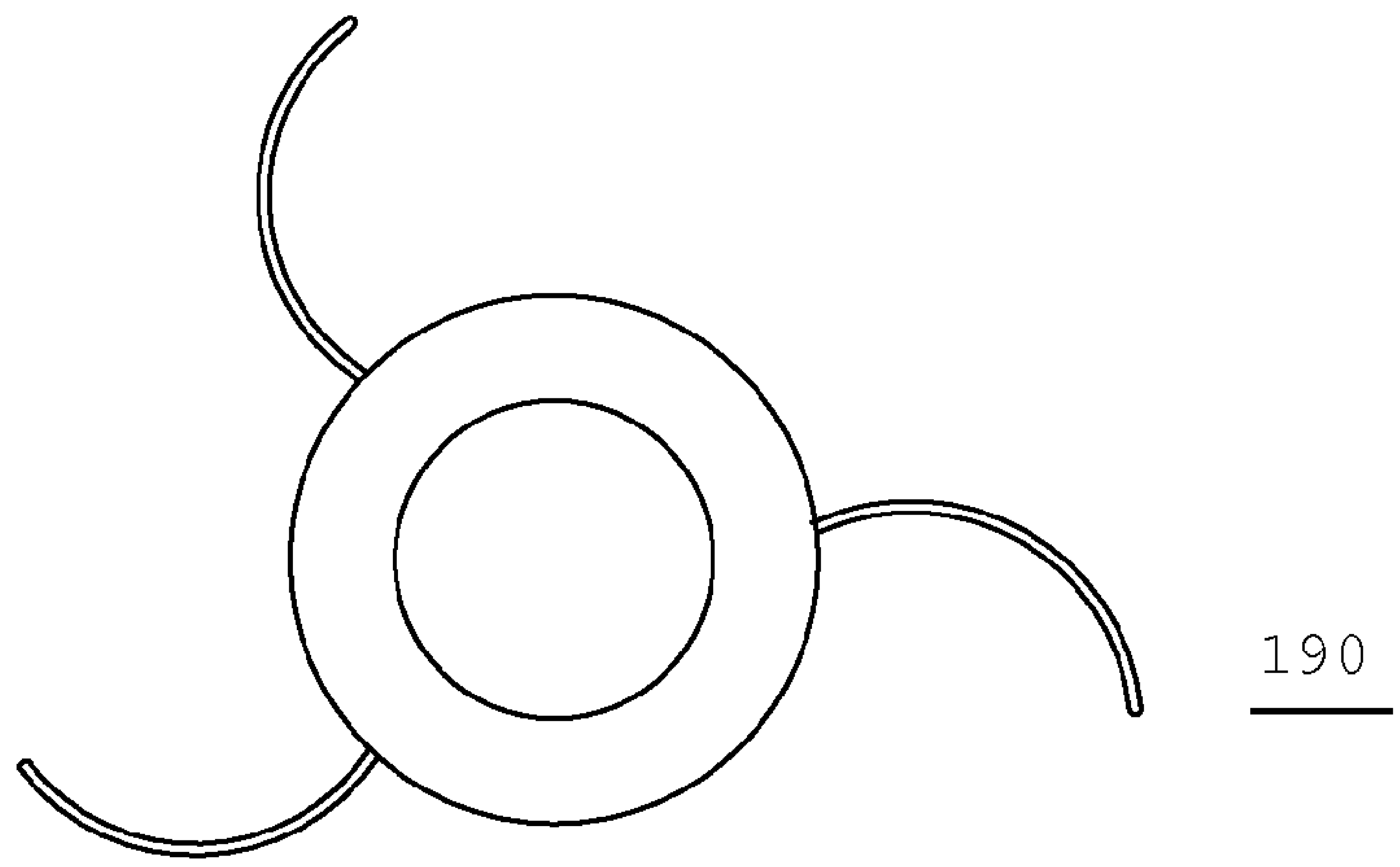


FIG. 8B

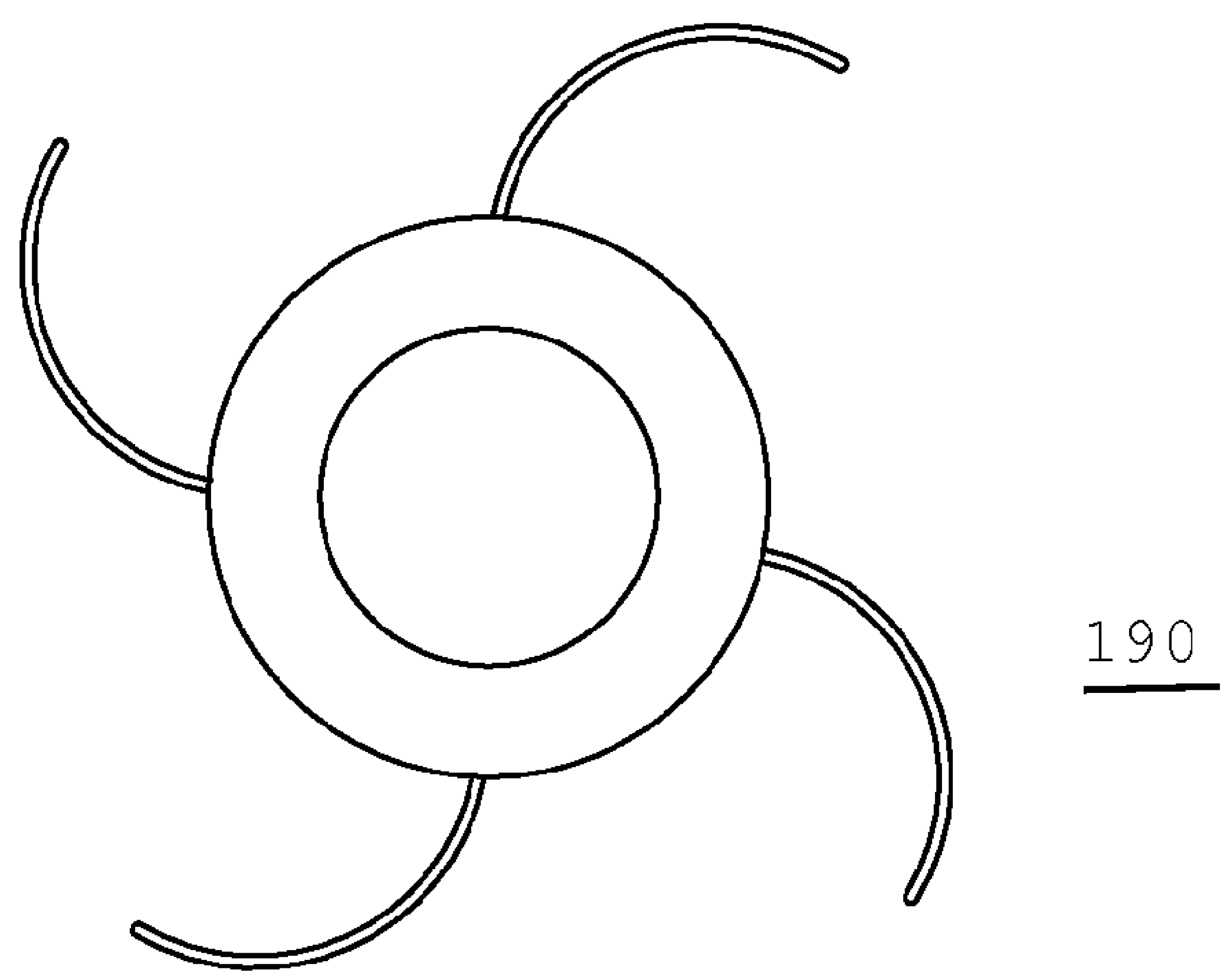


FIG. 8C

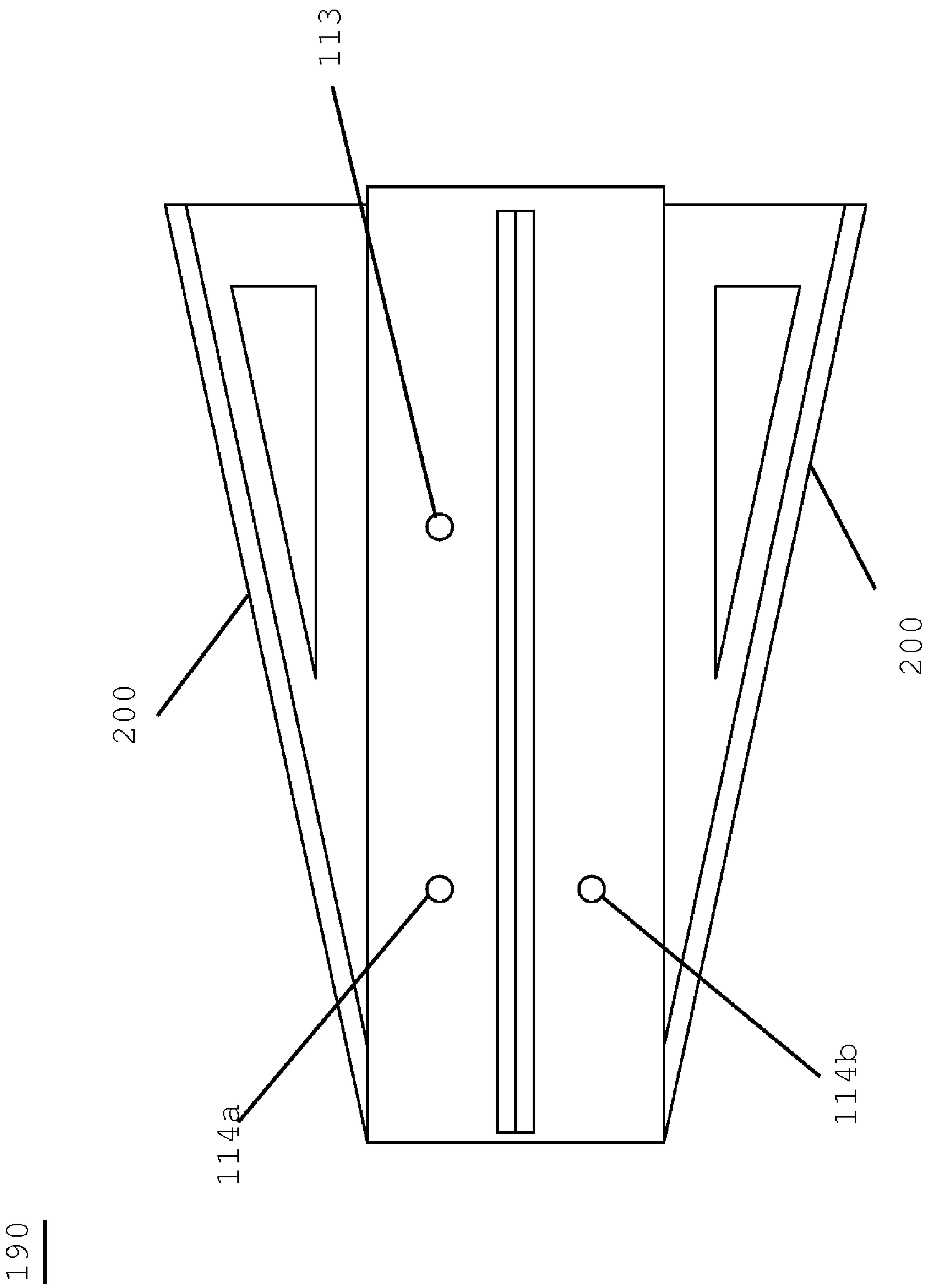


FIG. 9

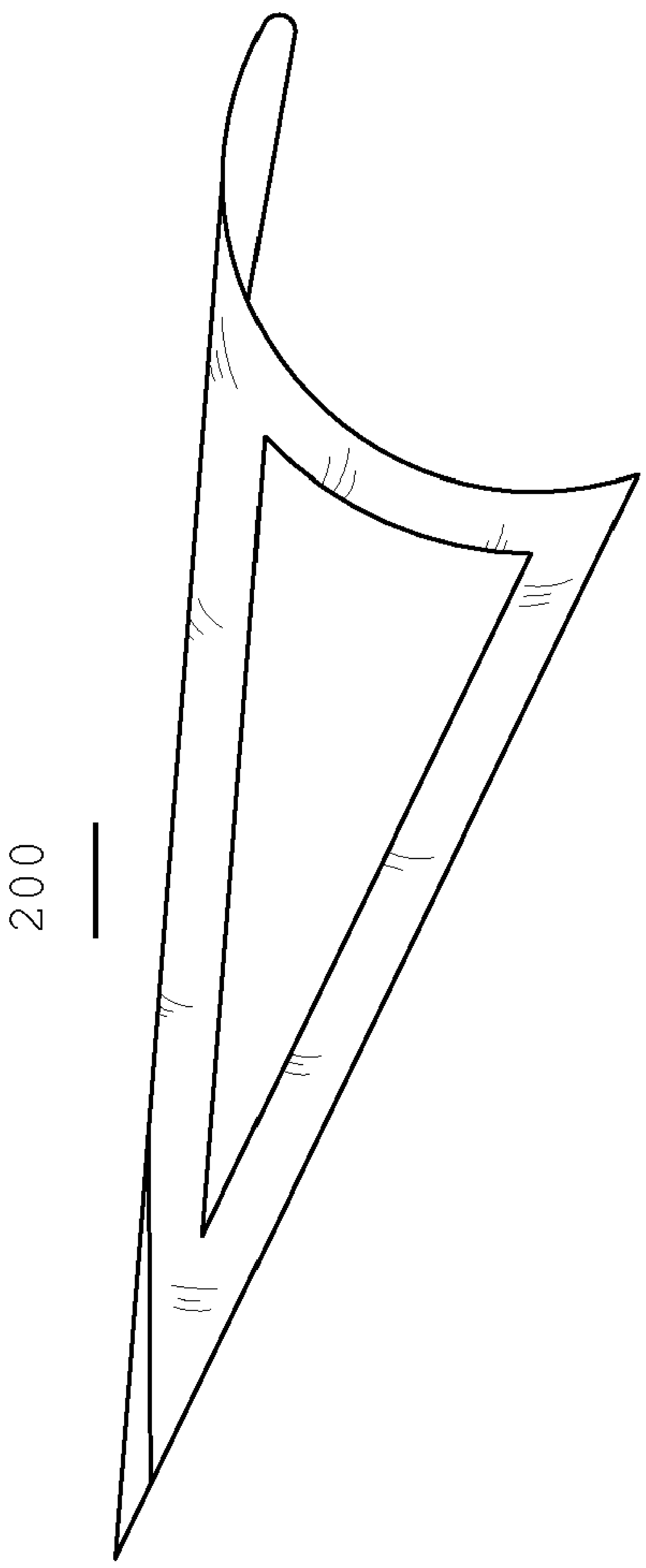


FIG. 10A

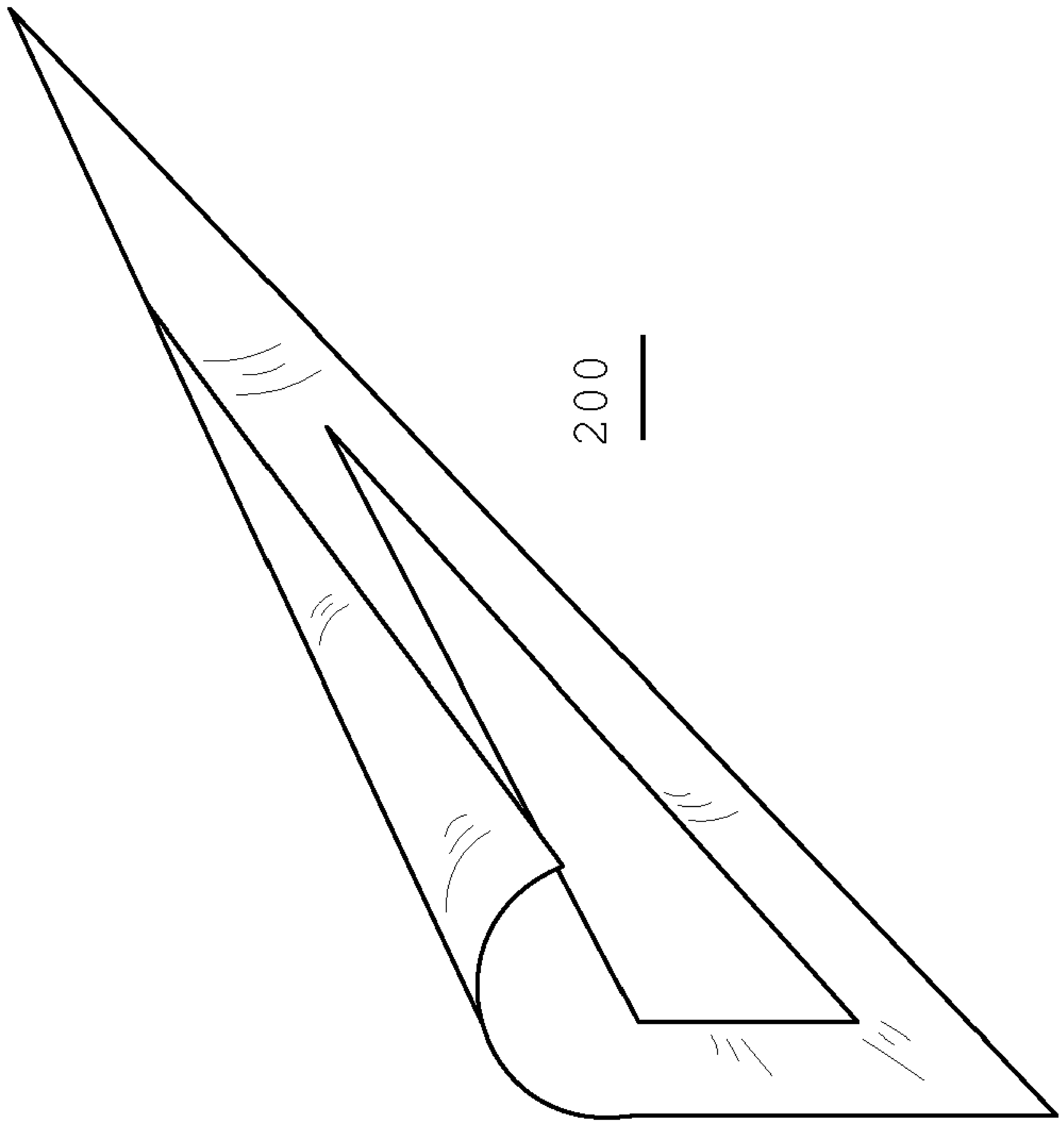


FIG. 10B

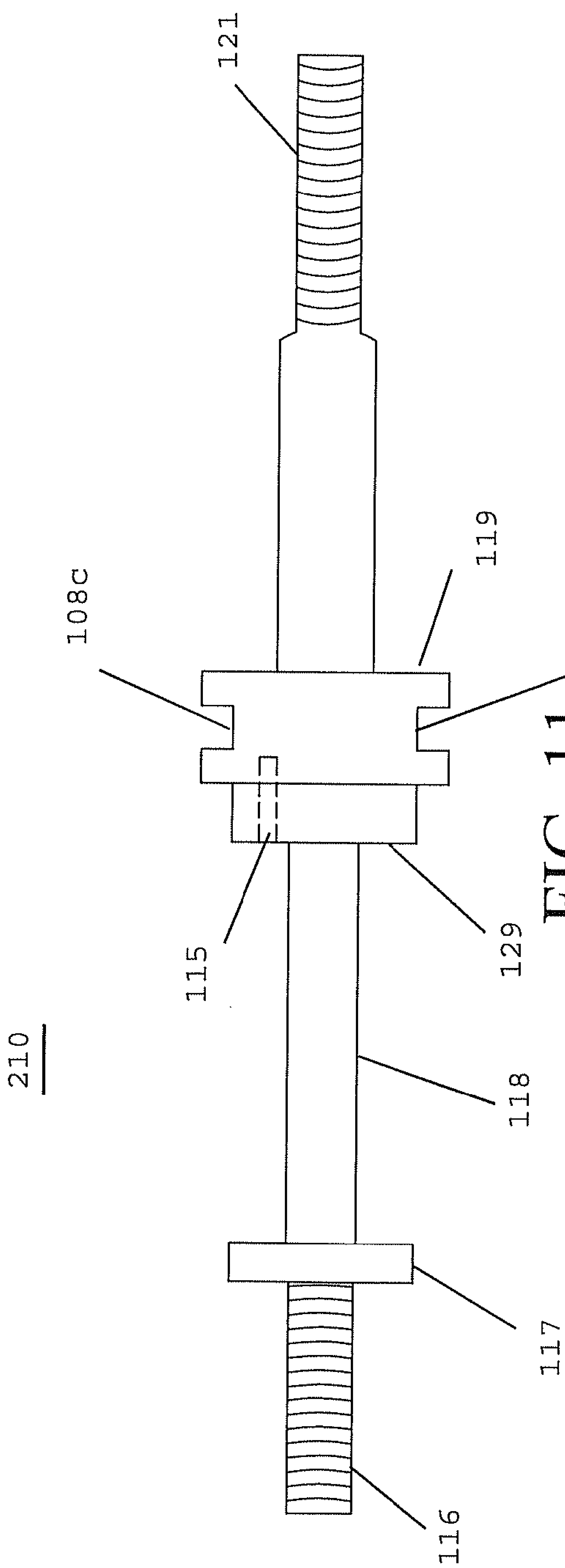


FIG. 11

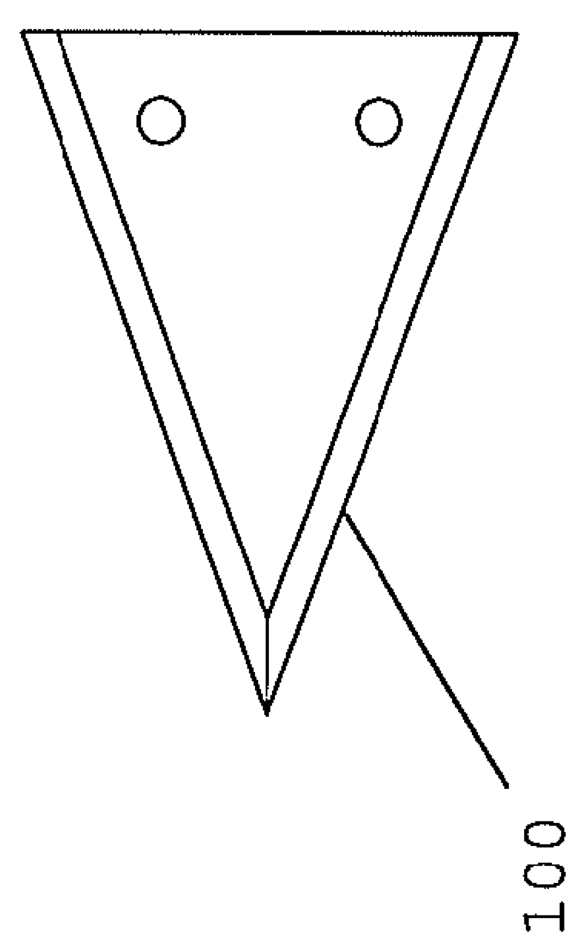


FIG. 12

ROTARY ARROWHEAD ASSEMBLY

FIELD

The present invention relates generally to arrowhead assemblies for use in bow-and-arrow target shooting and hunting; and, more specifically, to an improved broadhead-type arrowhead assembly having improved flight and performance characteristics achieved through the use of curved blades and rotational motion occurring during flight and continuing after impact of the arrowhead assembly.

BACKGROUND

A bow and arrow arrangement is a popular form of hunting game. The arrangement allows for improved accuracy and a quieter presence in the field as opposed to hunting with a rifle or a shotgun. An arrow typically comprises an arrowhead assembly with a pointed or tapered end and a shaft, an end of which shaft engages with a tension wire arrangement on the bow. A user may draw the shaft against the tension wire arrangement, and thereafter release the shaft, which propels the arrow away from the bow and the user after the tension wire arrangement returns to its rest position.

Arrowhead assemblies (also referred to herein as "broadheads") of arrows known in the art usually have straight blades that are in-line with regard to the shaft of the arrow. In this configuration, the arrow may rotate in flight after it is propelled away from the bow. However, the rotational motion will cease upon or shortly after impact on a target. Accordingly, upon striking a target, only the arrow's linear momentum will carry the arrow into the target. In such a case, the arrow may exit the mass of the target after entry. In the case where wild game is the target, the exiting of the arrow will decrease the probability that the game will be felled or killed by the arrow, and that the game will only be injured by the arrow. However, the game most likely will eventually bleed to death, which delay is an inhumane end to the game's life.

Attempts have been made to improve the rotational motion of an arrow and arrowhead assembly after the user has released the arrow from the bow, however, these attempts do not solve the problem of the cessation of rotational motion after impact of the arrowhead assembly.

Accordingly, there exists a need for an arrowhead assembly, and more specifically, an arrowhead assembly for use with a bow and arrow, that allows for still accuracy and consistency in flight before imparting rotational motion of the arrowhead assembly after the arrow's impact on a target. Further, the arrowhead assembly should be capable of manufacture in a lightweight, easy-to-use, and cost-effective manner.

SUMMARY

Briefly described, in a preferred embodiment, the present invention overcomes the above-mentioned disadvantages and meets the recognized need for such a device by providing an improved arrowhead assembly design which includes curved blades of increasing width as measured from the leading edge thereof to the central axis of the arrowhead assembly. The curved blades of the arrowhead assembly provides the arrowhead assembly improved rotational motion that effectively promotes true flight, enhanced and more forceful target penetration, and stable and predictable flight path.

Additionally, a spring arrangement, retained within the arrowhead assembly, is utilized to provide rotational motion of the arrowhead assembly upon impact with a target. The spring arrangement permits independent rotation of the arrowhead assembly relative to the arrow shaft, wherein the rotation of the arrowhead assembly is preferably substantially along the longitudinal axis of the shaft.

The spring arrangement insert of the present invention preferably enables the broadhead-type arrowhead assembly to rotate at a rate during flight that is independent from the arrow shaft rotation; and, further, upon impact with the target, allows the arrowhead assembly to continue in its rotation to penetrate a substantial distance into the target. Such characteristics are facilitated by the spiral-shaped, or twisting, nature of the blades as well as the rotational motion that is imparted by the spring arrangement after compression and expansion of the spring arrangement upon impact.

Accordingly, a feature and advantage of the present invention is its ability to overcome the deficiencies in prior art arrowhead assemblies by providing an improved arrowhead assembly in accordance with the disclosure herein.

Another feature and advantage of the present invention is its ability to provide an improved arrowhead assembly having improved cutting and target penetration characteristics.

Still another feature and advantage of the present invention is its ability to provide an improved arrowhead assembly having improved flight and accuracy characteristics.

A further feature and advantage of the present invention is its ability to provide an improved arrowhead assembly having more humane effects on a game target.

These and other features and advantages of the present invention will become more apparent to one skilled in the art from the following description and claims when read in light of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood by reading the Detailed Description with reference to the accompanying drawing figures, in which like reference numerals denote similar structure and refer to like elements throughout, and in which:

FIG. **1** is a view of a rotary arrowhead assembly in a disassembled state, according to a preferred embodiment of the present invention;

FIG. **2** is perspective views of a first blade and a cylindrical body of a rotary arrowhead assembly, according to a preferred embodiment of the present invention;

FIG. **3** is a view of a push spring of a rotary arrowhead assembly, according to a preferred embodiment of the present invention;

FIG. **4** is a view of a torsion spring of a rotary arrowhead assembly, in accordance with a preferred embodiment of the present invention;

FIG. **5** is a view of a firing pin of a rotary arrowhead assembly, in accordance with an exemplary embodiment of the present invention;

FIG. **6** is an alternate perspective view of a tubular body of a rotary arrowhead assembly, in accordance with a preferred embodiment of the present invention;

FIG. **7** is perspective views of a tubular body of a rotary arrowhead assembly, in accordance with a preferred embodiment of the present invention;

FIG. **8** is perspective views of alternate embodiments of a blade tube for a rotary arrowhead assembly, in accordance with preferred embodiments of the present invention;

FIG. **9** is a perspective view of a blade tube with firing pin holes and a torsion spring hole, in accordance with a preferred embodiment of the present invention;

FIG. **10** is perspective views of blades and blade arrangements, in accordance with a preferred embodiment of the present invention;

FIG. **11** is a perspective view of a coupling shaft of a rotary arrowhead assembly, in accordance with a preferred embodiment of the present invention; and

FIG. **12** is a view of a first blade of a rotary arrowhead assembly, in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION

In describing the preferred and selected alternate embodiments of the present invention, as illustrated in FIGS. **1-12**, specific terminology is employed for the sake of clarity. The invention, however, is not intended to be limited to the specific terminology so selected, and it is to be understood that each specific element includes all technical equivalents that operate in a similar manner to accomplish similar functions.

Referring now to FIG. **2**, in an embodiment, an arrowhead assembly comprises a first blade **100**, which blade comprises a pointed tip that is disposed at a first end of the assembly. In use, the pointed tip is the first point of contact of the assembly with a target as the assembly impacts a target. The blade **100** further comprises a plurality of beveled regions **102***a*, **102***b*, **102***c*, and **102***d*, which regions enable the assembly to pass through the mass of a target, and in one embodiment, shatter the bone matter of a game animal. FIG. **12** shows another perspective view of a blade **100**.

The first blade **100** is removably attached to a cylindrical body **106**, which body comprises a first end and a second end. The first end comprises a slot capable of receiving and securing a portion of the blade **100**. In an embodiment, the blade **100** is secured by roll pins **101***a* and **101***b* that project from a first and second point on the circumference of the body **106** through apertures in the blade and into a third and fourth point on the circumference of the body **106**.

The cylindrical body **106** further comprises a first elongated hollow region **103***a* and a second elongated hollow region **104***a*, each of which hollow regions are oriented substantially along the longitudinal axis of the cylinder and permit passage through the entire diameter of the cylindrical body **106**. The first hollow region **103***a* will be discussed in further detail in connection with FIG. **7**A. The second hollow region **104***a* will be discussed in further detail in connection with FIG. **5**. The second hollow region **104***a* further comprises opposing apertures **105***a* and **105***b* that extend from the interior of the cylindrical body **106** to the exterior of the cylindrical body **106**. The apertures **105***a* and **105***b* are aligned in a substantially linear configuration such that a roll pin (not shown) may be inserted through the apertures, which roll pin passes through the second hollow region **104***a*.

The cylindrical body **106** further comprises a shaft **107** disposed on and extending away from the second end of the body **107**. In an embodiment, the shaft **107** is cylindrical and is concentric to and of a smaller circumference than the body **106**. The shaft **107** is adapted to receive a push spring **120** (shown in FIG. **3**), around the circumference of the shaft **107**.

Referring to FIGS. **4**A and **4**B, the assembly further comprises a torsion spring **130**, which spring will be described in further detail below.

Referring to FIG. **5**, a firing pin **140** of an arrowhead assembly is shown. The firing pin comprises a flat ring portion and a cylindrical flange attached to and extending away from the ring portion. The firing pin **140** will be described in further detail below.

Referring now to FIGS. **6**, **7**A, and **7**B, alternate views of a tubular body **170** of an arrowhead assembly are shown. The tubular body **170** comprises a first end, a second end, and a hollow interior portion. The first end of the tubular body includes a flange region **150** that extends along a portion of the tubular body **170** and extends away from the circumference of the tubular body **170**. The flange region includes a pair of apertures **103***b* and **103***c* that are disposed linearly on opposite points of the circumference of the flange region and that are configured to accommodate a roll pin. FIG. **6** shows a perspective view of the first end of the tubular body **170**, including the interior region **180**, the exterior region **185**, and the apertures **103***b* and **103***c*. The flange region further comprises two substantially planar regions **108***a* and **108***b* that are adjacent to the apertures and are capable of accommodating a wrench for aiding in the installation and manipulation of the assembly.

The tubular body **170** further comprises an elongate slot **109** disposed on a section of the body. The slot is parallel to the axis of the tubular body and is of a length that is approximately one fifth of the length of the body. The slot **109** is configured to accommodate the cylindrical flange of the firing pin **140** and the slot includes a shelf **160** disposed at the end of the slot that is proximate to the first end of the body. The shelf sits below the exterior surface of the tubular body and is capable of accommodating the distal end of the cylindrical flange of the firing pin **140** such that the shelf may prevent the firing pin from rotating such that the firing pin of the flange does not enter the interior of the tubular body. The interior of the second end of the tubular body **170** comprises a female threaded portion **111**, the threads of which threaded portion are of a left-handed orientation, and which threads will be described in further detail below.

The tubular body **170** further comprises an access aperture **112** that is substantially opposite to the elongate slot **109**. The access aperture **112** is capable of accepting an instrument (not shown) to aid in the manipulation of the assembly in a pre-firing position (to be described in detail below).

Referring to FIGS. **8**A, **8**B, and **8**C, alternate embodiments of a blade tube **190** of an arrowhead assembly are shown. At least two blades **200** are disposed on and extend away from the blade tube **190**, which blades may be substantially planar or may be curved. FIGS. **10**A and **10**B show perspective views of a blade of the blades **200** that extend outwardly away from blade tube **190**. In an embodiment, a blade of the blades **200** comprises a cut-out portion that assists in reducing weight of the assembly. In another embodiment, the edge of a blade of the blades **200** that is distal to the tip of the assembly comprises a semi-cylindrical configuration, such that said distal edge may cause the blades to undergo a tunneling or spiral motion while passing through a target mass, which motion may reduce the resistance of the assembly's passage through the target and may increase the amount of mass of the target that is addressed by the assembly. In another embodiment, the edge of a blade of the blades that is distal to the tip of the assembly comprises a beveled region beginning at the side of the edge that is proximate to the interior of the cut-out portion and extending to the edge that is distal to the cut-out portion, which beveled region is disposed at an angle such that the region extends away from the semi-cylindrical edge of the blade. In an embodiment, the beveled region is at a 20 degree angle with respect to the flat edges of a blade.

Referring now to FIG. **9**, another view of blade tube **190** of an arrowhead assembly is shown. The blade tube comprises at least two blades **200** that extend outwardly away from the blade tube **190**. The blade tube **190** further comprises a hollow inner portion which is capable of accommodating a torsion spring and a shaft (which shaft will be described further in connection with FIG. **11**). The blade tube **190** further comprises a first torsion spring aperture **113**, which is capable of accommodating an end of a torsion spring. The blade tube **190** also comprises a plurality of firing pin apertures **114**, such as the apertures **114***a*, **114***b*, **114***c*, and **114***d*, which apertures **114***a* and **114***b* are disposed at substantially identical positions with regard to the distance from the tip of the assembly, and are spaced equidistant from each other along the circumference of the blade tube. In an embodiment, the blade tube comprises four firing pin apertures. With respect to the firing pin apertures **114**, the first torsion spring aperture **113** is situated near the end of the blade tube that is distal to the tip of the assembly, and the firing pin apertures **114** are disposed near the end of the blade tube that is proximate to the tip of the assembly.

Referring now to FIG. **11**, a substantially cylindrical coupling shaft **210** of an arrowhead assembly is shown. The shaft **210** comprises a first end and a second end. The first end comprises a male threaded region **116**, which male threaded region comprises left handed threads for coupling with the female threads **111** of the tubular body **170**. At the end of the threaded region **116** that is distal to the first end of the shaft a thread stop **117** extends outwardly from the shaft, which stop **117** limits the extent of coupling of the shaft and tubular body. Disposed between the thread stop **117** and a first stop flange **119** is a mandrel **118** which is capable of insertion through the interior of and retaining a torsion spring. Disposed at approximately the midpoint of the shaft is a stop flange **119**, which flange extends outwardly away from the circumference of the shaft. The flange **119** is substantially cylindrical and may comprise oppositely disposed planar regions **108***c* and **108***d* about its circumference, which planar regions **108***c* and **108***d* are capable of accommodating a wrench for aiding in the installation and manipulation of the assembly. A second torsion spring aperture **115** is disposed on the side of the flange **119** that abuts the mandrel **118**, which aperture **115** extends inwardly into the flange **119** and which aperture is capable of accepting an end of a torsion spring.

The second end of the shaft comprises a male threaded portion **121**, the threads of which are capable of mating with female threads of an arrow shaft known in the art to permit the assembly to securely attach to the arrow shaft to allow the assembly to be fired from a bow.

In use, the components of the assembly are put together to provide an arrowhead assembly with improved characteristics, including, but not limited to, the capability to rotate in flight and after impact.

To assemble an embodiment of assembly, the first blade **100** is inserted into the slot of the cylindrical body **106**, and the blade **100** is thereafter secured to the cylindrical body by roll pins **101***a* and **101***b*. A push spring is placed onto the shaft **107** of the cylindrical body **106**. A firing pin **140** is thereafter placed in the second hollow region **104***a* of the cylindrical body **106** such that the flat ring portion of the firing pin **140** is received in the second hollow region **104***a* of the cylindrical body. A roll pin may be inserted through aperture **105***a* of the cylindrical body **106**, on through the ring portion of the firing pin **140**, and on through aperture **105***b* of the cylindrical body to secure the firing pin **140** within the cylindrical body **106**.

The tubular body **170** is thereafter slid over the cylindrical body **106** such that the apertures **103***b* and **103***c* of the tubular body **170** are aligned with the first elongated hollow region **103***a* of the cylindrical body **106**, and the elongate slot **109** of the tubular body **170** is aligned with the second hollow region **104***a* of the cylindrical body **106**. When the tubular body **170** and cylindrical body **106** are so situated, a user thereafter may insert a roll pin (not shown) into the aperture **103***b* of the tubular body, such that the roll pin extends from the aperture **103***b* through the hollow region **103***a* of the cylindrical body and on into the aperture **103***c* of the tubular body. In such an embodiment, the roll pin secures the cylindrical body within the tubular body.

When the cylindrical body **106** is so secured within the tubular body **170**, the cylindrical flange of the firing pin **140** will extend out of the second hollow region **104***a* of the cylindrical body **106**, past the shelf **160** of the elongate slot of the tubular body **170** and out of the elongate slot **109** of the tubular body **170**, such that at least a portion of the cylindrical flange of the firing pin **140** protrudes out of the tubular body **170**. In an embodiment, a user may position an awl, a pin, or any other similar tool through the access aperture **112** to manipulate the firing pin into the preferred orientation. In this configuration of the cylindrical body and tubular body, the firing pin may pivot such that the cylindrical flange of the pin may be positioned against the shelf of the elongate slot of the tubular body or may be positioned substantially perpendicular to the axis of the cylindrical and tubular bodies, or any point in between.

A torsion spring **130** is thereafter inserted into the hollow inner portion of the blade tube **190** such that the hooked end of the torsion spring is received in by the torsion spring aperture **113** of the blade tube **190**. In this embodiment, the hooked end of the torsion spring **130** extends through the aperture **113** and outwardly away from the blade tube **190**, with a substantial portion of the remaining length of the torsion spring being contained within the blade tube **190**. In this embodiment, after attachment of the torsion spring **130**, the blade tube **190** is slid over the tubular body **170** such that the tubular body is accepted within a portion of the hollow inner portion of the blade tube **190** and such that the firing pin apertures **114** of the blade tube **190** are proximate to the blade end of the assembly.

In this embodiment, the coupling shaft **210** is thereafter slid into the blade tube such that the shaft **210** and mandrel **118** pass through the interior of the torsion spring until the substantially straight end of the torsion spring is received in the second torsion spring aperture **115** of the stop flange of the coupling shaft **210**.

Within the blade tube **190**, the threaded end of coupling shaft **210** is thereafter disposed against the corresponding threaded end of the tubular body **170**, and the threaded portions thereof are mated for attachment of the coupling shaft **210** to the tubular body **170**. In this attached configuration of the coupling shaft and the tubular body, the torsion spring and mandrel are received within the hollow portion of the blade tube **190** such that blade tube **190** covers the full length of the torsion spring. In this embodiment, the firing pin apertures **114** of the blade tube **190** may be substantially aligned with the cylindrical flange of the firing pin **140**, when the flange extends upwardly out of the cylindrical body **106** and tubular body **170**.

Further in this embodiment, the diameter of the tubular assembly corresponds to the diameter of inner hollow portion of the blade tube to allow the blade tube to rotate freely about the tubular body and to prevent the blade tube from moving in any other vector with respect to the stop flange.

With the hooked end of the torsion spring inserted in to the first torsion spring aperture **113** of the blade tube, the blade tube is operatively coupled with the torsion spring. In this embodiment, the blade tube may be rotated such that the torsion spring is compressed and mechanical energy is stored therein. After the blade tube **190** is so rotated to the user's preference, the firing pin may be inserted through a firing pin aperture **114** of the blade tube to secure the blade tube in place around the tubular body **170**.

In this embodiment, the end of the blade tube **190** that is proximate to the tip end of the assembly sits flush against the flange region **150** of the tubular body **170**, and the end of the blade tube that is distal to the tip end of the assembly sits flush against the first stop flange **119** of the coupling shaft **210**. In an embodiment, a second stop flange **129** that is concentric the first stop flange of the coupling shaft extends away from the distal end of the coupling shaft **210** and into the blade tube **190**, the diameter of which second stop flange corresponds to the diameter of inner hollow portion of the blade tube to allow the blade tube to rotate freely about the second stop flange and to prevent the blade tube from moving in any other vector with respect to the stop flange.

Before use, the male threaded portion **121** of the coupling shaft are mated with corresponding female threads of an arrow shaft (not shown) to permit the assembly to securely attach to the arrow shaft and to allow the assembly to be fired from a bow.

In use after assembly, the assembly may be fired from a bow. In flight, the assembly may rotate to improve aerodynamics and accuracy. Upon impact, the force of the impact causes the firing pin to move from its outwardly-projecting position to a position where its flange is disposed on the shelf of the elongate slot **109** of the tubular member **170**. In this position, the firing pin ceases its restriction of the rotation of the blade tube **190**, and the torsion spring thereafter imparts rotational motion upon the blade tube such that the blade tube rotates around the tubular member and about the longitudinal axis of the assembly. The rotational motion of the blade tube, combined with the configuration of the blades disposed on the blade tube, causes a boring effect inside the target after impact of the assembly upon the target. The boring effect improves the ease of passage of the assembly through the target as compared to existing arrowheads and arrow shafts, and, as further compared to existing arrowheads and arrow shafts, may cause a larger diameter and volume of the target's mass to be disrupted or removed upon passage of the assembly through the target. As a result, the assembly provides for a higher probability that a game target will be killed due to impact and passage therethrough of the assembly. This is as contrasted to the case of known arrowheads and arrow shafts, which may leave a small diameter of interruption after passing through a target, the result of which may not immediately kill a game target and may instead result in the target slowly bleeding to death.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is understood that various omissions, substitutions of equivalents are contemplated as circumstance may suggest or render expedient, but is intended to cover the application or implementation without departing from the spirit or scope of the claims of the present invention.

What is claimed is:

1. A rotary arrowhead assembly for impacting on a target, the assembly comprising

a first blade comprising a tip,

a cylindrical body,

a tubular body,

a firing pin,

a blade tube comprising at least one blade extending away from said blade tube,

a torsion spring,

a push spring,

a plurality of roll pins, and

a coupling shaft,

wherein said first blade is removably attached to said cylindrical body and is secured to said cylindrical body by way of at least two roll pins,

wherein said cylindrical body is removably coupled to and received within said tubular body,

wherein said firing pin is removably secured within said cylindrical and tubular bodies and within said blade tube in the assembly before impact of the assembly upon a target,

wherein said cylindrical and said tubular bodies as removably coupled to one another are received in a hollow inner portion of said blade tube,

wherein said blade tube is retained on the assembly by said tubular body and by said coupling shaft,

wherein said torsion spring is compressed within said blade tube during before impact, and

wherein said blade tube is precluded from rotating about said cylindrical and tubular bodies before impact.

2. The rotary arrowhead assembly of claim **1**, wherein after impact with a target said torsion spring decompresses and wherein said firing pin is dislodged from said tubular body and said blade tube,

whereby said decompression of said torsion spring and said dislodging of said firing pin allows said blade tube to rotate about said cylindrical and said tubular bodies after impact with a target.

3. The rotary arrowhead assembly of claim **1**, wherein said assembly is comprised of titanium.

4. The rotary arrowhead assembly of claim **1**, wherein said assembly is composed of aluminum.

5. The rotary arrowhead assembly of claim **1**, wherein said assembly is capable of being attached to an arrow shaft.

6. The rotary arrowhead assembly of claim **1**, wherein the first blade further comprises a plurality of beveled regions.

7. The rotary arrowhead assembly of claim **1**, wherein said cylindrical body comprises

a first elongated hollow region;

a second elongated hollow region, and

a shaft,

and wherein said second hollow region further comprises opposing apertures.

8. The rotary arrowhead assembly of claim **1**, wherein said tubular body comprises

a first end,

a second end,

a hollow interior portion,

an elongate slot disposed parallel to the axis of the tubular body, and

an access aperture;

wherein said first end of the tubular body further comprises a flange region that surrounds and extends away from the tubular body,

wherein said flange further comprises a pair of oppositely-disposed apertures situated on the circumference of the flange, which apertures are capable of accommodating a roll pin, and wherein said flange further comprises at least two substantially planar regions that are adjacent to said apertures;

wherein said elongate slot further comprises a shelf disposed at the end of said slot that is proximate to said first end of said tubular body;

wherein said second end of said tubular body further comprises a female threaded portion; and

wherein said access aperture is disposed substantially opposite to said elongate slot.

9. The rotary arrowhead assembly of claim **1**, wherein said blade tube comprises

a hollow inner portion,

a first torsion spring aperture, and

a plurality of firing pin apertures;

wherein said torsion spring aperture is capable of receiving an end of a torsion spring, and

wherein said plurality of firing pin apertures are capable of receiving at least a portion of a firing pin.

10. The rotary arrowhead assembly of claim **1**, wherein said coupling shaft comprises

a first end,

a second end,

a stop flange,

a mandrel, and

a second torsion spring aperture;

wherein said first end further comprises a male threaded region,

wherein said second end further comprises a male threaded region,

wherein said thread stop extends outwardly from said shaft,

wherein said stop flange is substantially circular and is disposed at the midpoint of said shaft,

wherein said flange further comprises at least two oppositely disposed planar regions on the circumference of said flange;

wherein said mandrel is disposed between said thread stop and said flange; and

wherein said torsion spring aperture is disposed on the side of said flange that is proximate to said mandrel, said aperture capable of receiving an end of a torsion spring.

11. The rotary arrowhead assembly of claim **1**, wherein said cylindrical body comprises a push spring disposed on said shaft of said cylindrical body.

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